

Europäisches Patentamt  
European Patent Office  
Office européen des brevets



(11) **EP 1 382 254 A1**

(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:  
21.01.2004 Bulletin 2004/04

(51) Int Cl.7: **A21B 7/00**

(21) Application number: **02258730.7**

(22) Date of filing: **18.12.2002**

(84) Designated Contracting States:  
**AT BE BG CH CY CZ DE DK EE ES FI FR GB GR  
IE IT LI LU MC NL PT SE SI SK TR**  
Designated Extension States:  
**AL LT LV MK RO**

- **Lee, Jong-wook**  
Suji-eup, Yongin city, Kyungki-do (KR)
- **Lee, Tae-uk, Daesung villa # 201**  
Suwon city, Kyungki-do (KR)
- **Sung, Han-jun, Jugong Apt, # 909-202**  
Suwon city, Kyungki-do (KR)

(30) Priority: **19.07.2002 KR 2002042589**

(71) Applicant: **Samsung Electronics Co., Ltd.**  
Suwon City, Kyungki-do (KR)

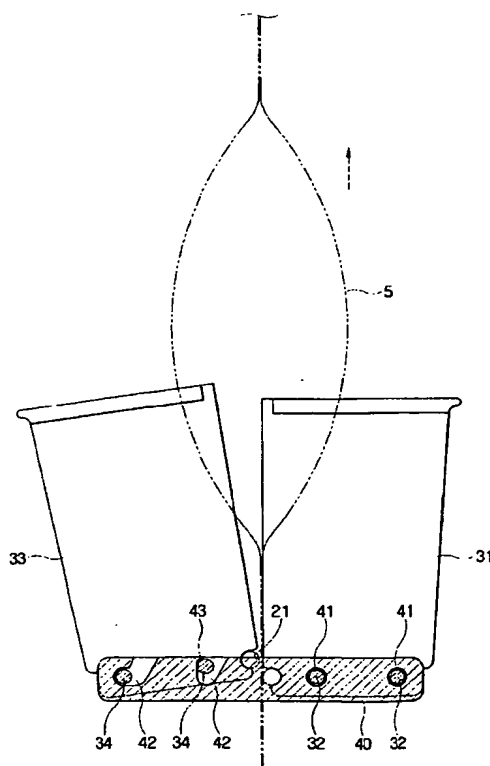
(74) Representative: **Brandon, Paul Laurence et al**  
**APPLEYARD LEES,**  
15 Clare Road  
Halifax HX1 2HY (GB)

(72) Inventors:  
• **Park, Jae-ryong**  
Paldal-ku, Suwon City, Kyungki-do (KR)

(54) **Improvements in and relating to bread makers**

(57) A bread maker, including a main body (1) having a baking space (10) and kneading drums (11, 12) located at an upper part and a lower part in the baking space (10). The kneading drums (11, 12) hold opposite ends of a mixing bag (5). A movable tray member (33) has a plurality of combining projections (34) at opposite side walls thereof. A fixed tray member (31) positioned opposite the movable tray member (33) forms a slit (21) through which the mixing bag (5) passes. A tray holder (40) is coupled to each end of the fixed tray member (31) and the movable tray member (33). Each tray holder (40) fixedly supports the fixed tray member (31), and has a plurality of guide grooves (42) accommodating the combining projections (34) to rotatably support the movable tray member (33). Anchoring prominences (43) are on the guide grooves (42) adjacent to the fixed tray member (31), preventing the combining projections (34) from breaking away from the guide grooves (42) when the movable tray member (33) rotates.

**FIG. 4A**



## Description

[0001] The present invention relates to bread makers and to baking tray assemblies for bread makers, and more particularly, though not exclusively, to a bread maker having a baking tray assembly with a fixed tray member and a movable tray member, in which noise generated due to a collision between the fixed tray member and the movable tray member as dough for the bread is kneaded is reduced.

[0002] Generally, a bread maker has been used in the home for automatically kneading, fermenting, and baking bread.

[0003] For example, as shown in Figures 5 and 6, a bread maker disclosed in Korean Patent Application No. KR-A-2000-86024 includes a main body 101 having a baking space 110, a door 103 to open and close an opening formed at the front of the main body 101, and a panel 102 to manipulate the bread maker, which is provided at one side of the front of the main body 101.

[0004] At upper and lower parts of the baking space 110 are an upper kneading drum 111 and a lower kneading drum 112 for respectively winding an upper end and a lower end of a mixing bag (not shown) containing ingredients for dough. The upper kneading drum 111 and the lower kneading drum 112 are parallel to one another, and rotate reciprocally. Between the upper kneading drum 111 and the lower kneading drum 112 are a pair of a kneading supporting members 113 that prevent kneading ingredients in the mixing bag from being pushed out toward the upper kneading drum 111.

[0005] Also, between the kneading supporting member 113 and the lower kneading drum 112 is a baking tray 104 accommodating the kneaded ingredients, which may be withdrawn from the baking space 110 and removed from the bread maker.

[0006] The baking tray 104 is a rectangular container opening upwardly and is formed of a combination of a first tray member 140 and a second tray member 150. A slit 160 is formed between the first tray member 140 and the second tray member 150 where the first tray member 140 and the second tray member 150 join together.

[0007] As shown in Figure 6, on each lower end of both side walls of the first tray member 140 is a protrusion rib 141 that is slidably coupled to a guide 114 (Figure 5) in the baking space 110. Each protrusion rib 141 has a plurality of accommodating grooves 142 caved downwardly from the surface thereof.

[0008] On a lower end of both side walls of the second tray member 150 are a plurality of projections 151 that protrude from the surface thereof and are movably accommodated in the accommodating grooves 142 of the protrusion ribs 141.

[0009] The upper end of the mixing bag is wound on the upper kneading drum 111. The lower end of the mixing bag is wound on the lower drum 112 through the pair of kneading support members 113 and through the slit

160 formed on the bottom of the baking tray 104. Further, during kneading, the mixing bag containing the ingredients for the dough is reciprocated upwardly and downwardly by the upper kneading drum 111 and the lower kneading drum 112. Thus, the ingredients for the dough contained in the mixing bag are kneaded between the pair of kneading support members 113 and the baking tray 104.

[0010] After the kneading process is completed, the kneaded dough is placed in the baking tray 104 and the mixing bag is removed, and then the dough is made into bread using a heater 106.

[0011] In the conventional bread maker, when the mixing bag moves upwardly through the slit 160 of the baking tray 104 during the kneading process, the second tray member 150 rotates upwardly along with the mixing bag and is rotated at a predetermined angle relative to the protrusion ribs 141 because the projections 151 of the second tray member 150 are movably accommodated in the accommodating grooves 142 of the protrusion ribs 141.

[0012] Further, when the mixing bag moves downwardly, the second tray member 150, which has been rotated at the predetermined angle relative to the protrusion ribs 141, moves downwardly with the mixing bag to an initial position, to form the baking tray 104 having the slit 160 between the first tray member 140 and the second tray member 150.

[0013] However, as the second tray member 150 rotates downwardly to the initial position, a noise is generated when the second tray member 150 impacts the first tray member 140.

[0014] It is an aim of preferred embodiments of the present invention to provide a bread maker for reducing a noise generated due to a collision between a fixed tray member and a movable tray member.

[0015] According to an aspect of the present invention, there is provided a bread maker, comprising a main body having a baking space; kneading drums located at an upper part and a lower part in the baking space, the kneading drums holding opposite ends of a mixing bag; a movable tray member having a plurality of combining projections at opposite side walls thereof; a fixed tray member positioned opposite the movable tray member to form a slit through which the mixing bag passes; tray holders coupled to each end of the fixed tray member and the movable tray member, the tray holders fixedly supporting the fixed tray member, and having a plurality of guide grooves accommodating the combining projections to rotatably support the movable tray member; and anchoring prominences on the guide grooves adjacent to the fixed tray member, preventing the combining projections from breaking away from the guide grooves when the movable tray member rotates.

[0016] The bread maker may further comprise guide members located at opposite side walls in the baking space, wherein the tray holders are slidably coupled to the guide members.

[0017] Suitably, each anchoring prominence is located on an upper opening of a corresponding one of the guide grooves.

[0018] According to another aspect of the present invention, there is provided a baking tray assembly for a bread maker, comprising tray holders having a plurality of guide grooves on a first end of each tray holder; a fixed tray having an open side and being fixedly attached to a second end of each tray holder; a movable tray having another open side and a plurality of projections on opposite side walls thereof, the guide grooves of the tray holders rotatably accommodating the projections of the movable tray, with the movable tray adjacent to the fixed tray and the open sides of the movable tray and the fixed tray facing one another to form a container; and anchors projecting into upper openings of the guide grooves adjacent to the fixed tray to prevent the projections from exiting the guide grooves when the movable tray rotates.

[0019] According to the present invention in a third aspect, there is provided a baking tray assembly for a bread maker, comprising: means for fixedly attaching each end of a fixed tray to a first side of tray holders; means for rotatably attaching each end of a movable tray to a second side of the tray holders; and means for limiting a rotation angle of the movable tray as the movable tray rotates to reduce noise generated as the movable tray returns to an initial position and contacts the fixed tray.

[0020] Further features of the present invention are set out in the appended claims.

[0021] These together with other aspects and advantages which will be subsequently apparent, reside in the details of construction and operation as more fully hereinafter described and claimed, reference being had to the accompanying drawings forming a part thereof, wherein like numerals refer to like parts throughout.

[0022] These and other objects and advantages of the present invention will become apparent and more readily appreciated from the following description of an embodiment thereof, by way of example only, taken in conjunction with the accompanying drawings, of which:

Figure 1 is a perspective view of a bread maker according to an embodiment of the present invention;

Figure 2 is an exploded perspective view of a baking tray shown in Figure 1;

Figure 3 is an enlarged view of the baking tray of Figure 2;

Figures 4A and 4B are sectional views of the baking tray of Figure 1 taken along line IV-IV;

Figure 5 is a perspective view of a conventional bread maker; and

Figure 6 is an exploded perspective view of a baking tray shown in Figure 5.

[0023] Hereinafter, an embodiment of the present invention will be described in detail with reference to the attached drawings, wherein the like reference numerals refer to the like elements throughout. The present invention may, however, be embodied in many different forms and should not be construed as being limited to the embodiments set forth herein; rather, this embodiment is provided so that the present disclosure will be thorough and complete, and will fully convey the concept of the invention to those skilled in the art.

[0024] Referring to Figures 1 and 2, a bread maker according to an embodiment of the present invention includes a main body 1 having a baking space 10, a door 3 to open and close an opening formed at the front of the main body 1, and a panel 2 to manipulate the bread maker, which is provided at one side of the front of the main body 1.

[0025] At an upper part and a lower part of the baking space 10 are an upper kneading drum 11 and a lower kneading drum 12 for respectively winding an upper end and a lower end of a mixing bag 5 (Figure 4A) containing ingredients for dough. The upper kneading drum 11 and the lower kneading drum 12 are parallel to one another and rotate reciprocally. Between the upper kneading drum 11 and the lower kneading drum 12 are a pair of kneading supporting members 13 that prevent kneading ingredients in the mixing bag from moving out toward the upper kneading drum 11.

[0026] Also, between the kneading supporting member 13 and the lower kneading drum 12 is a baking tray assembly 20 accommodating the kneaded ingredients, which may be withdrawn from the baking space 10 and removed from the bread maker.

[0027] The baking tray assembly 20 has a baking tray 30 including a fixed tray member 31 and a movable tray member 33, and a pair of tray holders 40 respectively coupled to end parts of the fixed tray member 31 and the movable tray member 33.

[0028] On a lower end of each side wall of the fixed tray member 31 are fixing projections 32 that protrude from the surface thereof and engage the tray holders 40 (refer to Figure 4A). On a lower end of each side wall of the movable tray member 33 are combining projections 34 that protrude from the surface thereof and are movably coupled to the tray holders 40.

[0029] The tray holders 40 are slidably coupled to guide members 14, which are provided at both side walls in the baking space 10 and are opposite one another.

[0030] On an area of the tray holders 40 adjacent to the fixed tray member 31 are fixed projection accommodating grooves 41 for accommodating the fixing projections 32 of the fixed tray member 31 (Figure 4A). On an area of the tray holders 40 adjacent to the movable tray member 33 are guide grooves 42 that cave downwardly

from the surface thereof for movably accommodating the combining projections 34 of the movable tray member 33.

**[0031]** As shown in Figure 3, on an upper opening area of each guide groove 42 adjacent to the fixed tray member 31 is an anchoring prominence 43 for preventing the combining projections 34 that are accommodated in the guide grooves 42 from breaking away from the tray holders 40.

**[0032]** Accordingly, the fixing projections 32 of the fixed tray member 31 are coupled to the fixed projection accommodating grooves 41, thereby mounting the fixed tray member 31 on the tray holders 40. Also, the combining projections 34 of the movable tray member 33 are movably inserted into the guide grooves 42 of the tray holders 40, thereby movably mounting the movable tray member 33 on the tray holders 40.

**[0033]** As described above, the fixed tray member 31 and the movable tray member 33 face one another by use of the tray holders 40, thereby forming the baking tray 30 having a rectangular container opening upwardly. Thus, on the baking tray 30 is formed a slit 21 along the contact area of the fixed tray member 31 and the movable tray member 33.

**[0034]** The upper end of the mixing bag 5 (Figure 4A) is wound on the upper kneading drum 11. The lower end of the mixing bag 5 is wound on the lower kneading drum 12 through the pair of kneading support members 13 and through the slit 21 formed on the bottom of the baking tray 30. Further, during kneading, the mixing bag 5 containing the ingredients for the dough reciprocates upwardly and downwardly according to rotation of the upper kneading drum 11 and the lower kneading drum 12. Thus, the ingredients for the dough contained in the mixing bag 5 are kneaded between the kneading support members 13 and the baking tray 30.

**[0035]** After the kneading process is completed, the mixing bag 5 is detached from the upper kneading drum 11 while the lower kneading drum 12 rotates. The mixing bag 5 passes through the kneading support members 13, and then passes through the slit 21. Further, when the mixing bag 5 passes through the slit 21 of the baking tray 30, the kneaded dough contained in the mixing bag 5 does not pass through the slit 21 of the baking tray 30 and, thus, is removed from the mixing bag 5 and accommodated in the baking tray 30. As the mixing bag 5 passes through the slit 21, the mixing bag 5 is wound on the lower kneading drum 12. Thus, the dough accommodated in the baking tray 30 is made into bread by using a heater 16 in the baking space 10.

**[0036]** Referring to Figures 4A and 4B, when the mixing bag 5 containing the ingredients for the dough reciprocates upwardly and downwardly through the slit 21 and is kneaded between the kneading support members 13 and the baking tray 30 during the kneading process, the movable tray member 33 rotates clockwise and counterclockwise as the mixing bag 5 moves upwardly and downwardly through the slit 21 because the movable

tray member 33 is movably coupled to the tray holders 40.

**[0037]** For example, referring to Figure 4A, when the mixing bag 5, which has a lower end that passes through the slit 21, moves upwardly, the movable tray member 33 rotates counterclockwise away from the fixed tray member 31 by pivoting around the leftmost combining projections 34. Thus, the combining projections 34 of the movable tray member 33 accommodated in the guide grooves 42 adjacent the slit 21 also rotate and are stopped by the anchoring prominences 43. Consequently, the movable tray member 33 rotates until the combining projections 34 engage the anchoring prominences 43 of the guide grooves 42.

**[0038]** On the other hand, referring to Figure 4B, when the mixing bag 5 moves downwardly through the slit 21, the movable tray member 33 rotates clockwise around the leftmost combining projections 34 towards the fixed tray member 31, thereby allowing the combining projections 34 engaging the anchoring prominences 43 of the guide grooves 42 to move into the guide grooves 42 again.

**[0039]** According to the embodiment of the present invention described above, the movable tray member 33 rotates away from the fixed tray member 31 as the mixing bag 5 moves upwardly, and the combining projections 34 accommodated in the guide grooves 42 that adjoin the fixed tray member 31 are prevented from breaking away by the anchoring prominences 43 of the guide grooves 42, thereby preventing the movable tray member 33 from rotating at an excessive angle relative to the tray holders 40.

**[0040]** Then, while the movable tray member 33 returns to its initial position in which the movable tray member 33 and the fixed tray member 31 face one another to form the baking tray 30, the impact of the movable tray member 33 on the fixed tray member 31 at the moment the movable tray member 33 contacts the fixed tray member 31 is minimized, thereby reducing the noise generated by the impact.

**[0041]** Although an embodiment of the present invention has been shown and described, it will be appreciated by those skilled in the art that changes may be made in this embodiment without departing from the principles and spirit of the invention, the scope of which is defined in the appended claims and their equivalents.

**[0042]** The reader's attention is directed to all papers and documents which are filed concurrently with or previous to this specification in connection with this application and which are open to public inspection with this specification, and the contents of all such papers and documents are incorporated herein by reference.

**[0043]** All of the features disclosed in this specification (including any accompanying claims, abstract and drawings), and/or all of the steps of any method or process so disclosed, may be combined in any combination, except combinations where at least some of such features and/or steps are mutually exclusive.

**[0044]** Each feature disclosed in this specification (including any accompanying claims, abstract and drawings), may be replaced by alternative features serving the same, equivalent or similar purpose, unless expressly stated otherwise. Thus, unless expressly stated otherwise, each feature disclosed is one example only of a generic series of equivalent or similar features.

**[0045]** The invention is not restricted to the details of the foregoing embodiment(s). The invention extends to any novel one, or any novel combination, of the features disclosed in this specification (including any accompanying claims, abstract and drawings), or to any novel one, or any novel combination, of the steps of any method or process so disclosed.

## Claims

### 1. A bread maker, comprising:

a main body (1) having a baking space (10);

kneading drums (11, 12) located at an upper part and a lower part in the baking space (10), the kneading drums (11, 12) holding opposite ends of a mixing bag (5);

a movable tray member (33) having a plurality of combining projections (34) at opposite side walls thereof;

a fixed tray member (31) positioned opposite the movable tray member (33) to form a slit (21) through which the mixing bag (5) passes;

tray holders (40) coupled to each end of the fixed tray member (31) and the movable tray member (33), respectively, the tray holders (40) fixedly supporting the fixed tray member (31), and having a plurality of guide grooves (42) accommodating the combining projections (34) to rotatably support the movable tray member (33); and

anchoring prominences (43) on the guide grooves (42) adjacent to the fixed tray member (31), preventing the combining projections (34) from breaking away from the guide grooves (42) when the movable tray member (33) rotates.

2. The bread maker according to claim 1, further comprising guide members (14) located at opposite side walls in the baking space (10), wherein the tray holders (40) are slidably coupled to the guide members (14).

3. The bread maker according to claim 1 or claim 2,

wherein each anchoring prominence (43) is located on an upper opening of the guide grooves (42).

4. The bread maker according to any preceding claim, further comprising a control panel (2) in a front side of the main body (1) to allow a user to control the bread maker.

5. The bread maker according to any preceding claim, further comprising a heater (16) in the baking space (10) to bake the bread.

6. The bread maker according to any preceding claim, wherein the fixed tray member (31), the movable tray member (33), the tray holders (40), and the anchoring prominences (43) form a baking tray assembly (20) located between the kneading drums (11, 12), the baking tray assembly (20) holding kneaded dough for baking and being removable from the baking space (10).

7. The bread maker according to any preceding claim, further comprising a plurality of fixing projections (32) at opposite side walls of the fixed tray member (31) and a plurality of fixed projection accommodating grooves (41) on an end of each tray holder (40) adjacent to the fixed tray member (31), the fixed projection accommodating grooves (41) receiving the fixing projections (32) to mount the fixed tray member (31) to the tray holders (40).

8. The bread maker according to any preceding claim, wherein the guide grooves (42) cave downwardly from a surface thereof to movably accommodate the combining projections (34) of the movable tray member (33).

9. The bread maker according to any preceding claim, wherein the movable tray member (33) faces the fixed tray member (31) to form a rectangular baking tray container for holding and baking the bread.

10. The bread maker according to any preceding claim, wherein the slit (21) is formed along a contact area between the fixed tray member (31) and the movable tray member (33).

11. The bread maker according to any preceding claim, wherein the kneading drums (11, 12) are parallel to one another and include an upper kneading drum (11) and a lower kneading drum (12), the upper kneading drum (11) receiving and winding an upper end of the mixing bag (5) and the lower kneading drum (12) receiving and winding a lower end of the mixing bag (5), the upper kneading drum (11) and the lower kneading drum (12) rotating reciprocally to respectively wind the upper end and the lower end of the mixing bag (5).

12. The bread maker according to claim 11, further comprising kneading support members (13) between the upper kneading drum (11) and the lower kneading drum (12) to prevent kneading ingredients in the mixing bag (5) from moving out and toward the upper kneading drum (11). 5
13. The bread maker according to claim 12, wherein the lower end of the mixing bag (5) is wound on the lower kneading drum (12) through the kneading support members (13) and the slit (21), and ingredients for dough contained in the mixing bag (5) are kneaded between the kneading support members (13) and the fixed tray member (31) and the movable tray member (33). 10
14. The bread maker according to claim 13, wherein after the ingredients in the mixing bag (5) have been kneaded, the mixing bag (5) is detached from the upper kneading drum (11) while the lower kneading drum (12) continues rotating and winding the mixing bag, with the mixing bag (5) passing through the slit (21) to empty the kneaded ingredients from the mixing bag (5) into a container formed by the fixed tray member (31) and the movable tray member (33). 20
15. The bread maker according to any one of claims 12-14, wherein when the mixing bag (5) reciprocates upwardly and downwardly through the slit (21) while the ingredients are kneaded, the movable tray member (33) rotates away from and towards the fixed tray member (31) as the mixing bag (5) moves upwardly and downwardly, respectively, the rotation of the movable tray member (33) away from the fixed tray member (31) being stopped when the combining projections (34) contact the anchoring prominences (43) of the tray holders (40) to limit an angle of rotation of the movable tray member (33), and the movable tray member (33) rotating towards the fixed tray member (31) to return to an initial position as the mixing bag (5) reciprocates downwardly through the slit (21), the limited angle of rotation reducing noise generated when the movable tray member (33) contacts the fixed tray member (31). 40
16. A baking tray assembly (20) for a bread maker, comprising: 45
- tray holders (40) having a plurality of guide grooves (42) on a first end of each tray holder (40); 50
- a fixed tray (31) having an open side and being fixedly attached to a second end of each tray holder (40);
- a movable tray (33) having another open side and a plurality of projections (34) on opposite

side walls thereof, the guide grooves (42) of the tray holders (40) rotatably accommodating the projections (34) of the movable tray (33), with the movable tray (33) adjacent to the fixed tray (31) and the open sides of the movable tray (33) and the fixed tray (31) facing one another to form a container; and

anchors (43) projecting into upper openings of the guide grooves (42) adjacent to the fixed tray (31) to prevent the projections (34) from exiting the guide grooves (42) as the movable tray (33) rotates.

- 15 17. The baking tray assembly according to claim 16, further comprising a plurality of fixing projections (32) at opposite side walls of the fixed tray (31) and a plurality of fixed grooves (41) on an end of each tray holder (40) adjacent to the fixed tray (31), the fixed grooves (41) receiving the fixing projections (32) to mount the fixed tray (31) to the tray holders (40). 20
18. The baking tray assembly according to claim 16, wherein the guide grooves (42) cave downwardly from a surface thereof to movably accommodate the projections (34) of the movable tray member (33). 25
19. The baking tray assembly according to claim 16, wherein a slit (21) is formed along a contact area between the fixed tray (31) and the movable tray (33). 30
20. The baking tray assembly according to claim 19, wherein a mixing bag (5) containing ingredients for the bread reciprocates upwardly and downwardly through the slit (21) while the ingredients are kneaded, with the movable tray (33) rotating away from and towards the fixed tray member (31) as the mixing bag (5) moves upwardly and downwardly, respectively, the rotation of the movable tray (33) away from the fixed tray member (31) being stopped when the projections (34) contact the anchors (43) of the tray holders (40) to limit an angle of rotation of the movable tray (33), and the movable tray (33) rotating towards the fixed tray member (31) to return to an initial position as the mixing bag (5) reciprocates downwardly through the slit (21), the limited angle of rotation reducing noise generated when the movable tray (33) contacts the fixed tray member (31). 40
21. A baking tray assembly (20) for a bread maker, comprising: 45

means for fixedly attaching each end of a fixed tray (31) to a first side of tray holders (40);

means for rotatably attaching each end of a movable tray (33) to a second side of the tray holders (40); and

means for limiting a rotation angle of the movable tray (33) as the movable tray (33) rotates to reduce noise generated as the movable tray (33) returns to an initial position and contacts the fixed tray (31).

5

10

15

20

25

30

35

40

45

50

55

FIG. 1

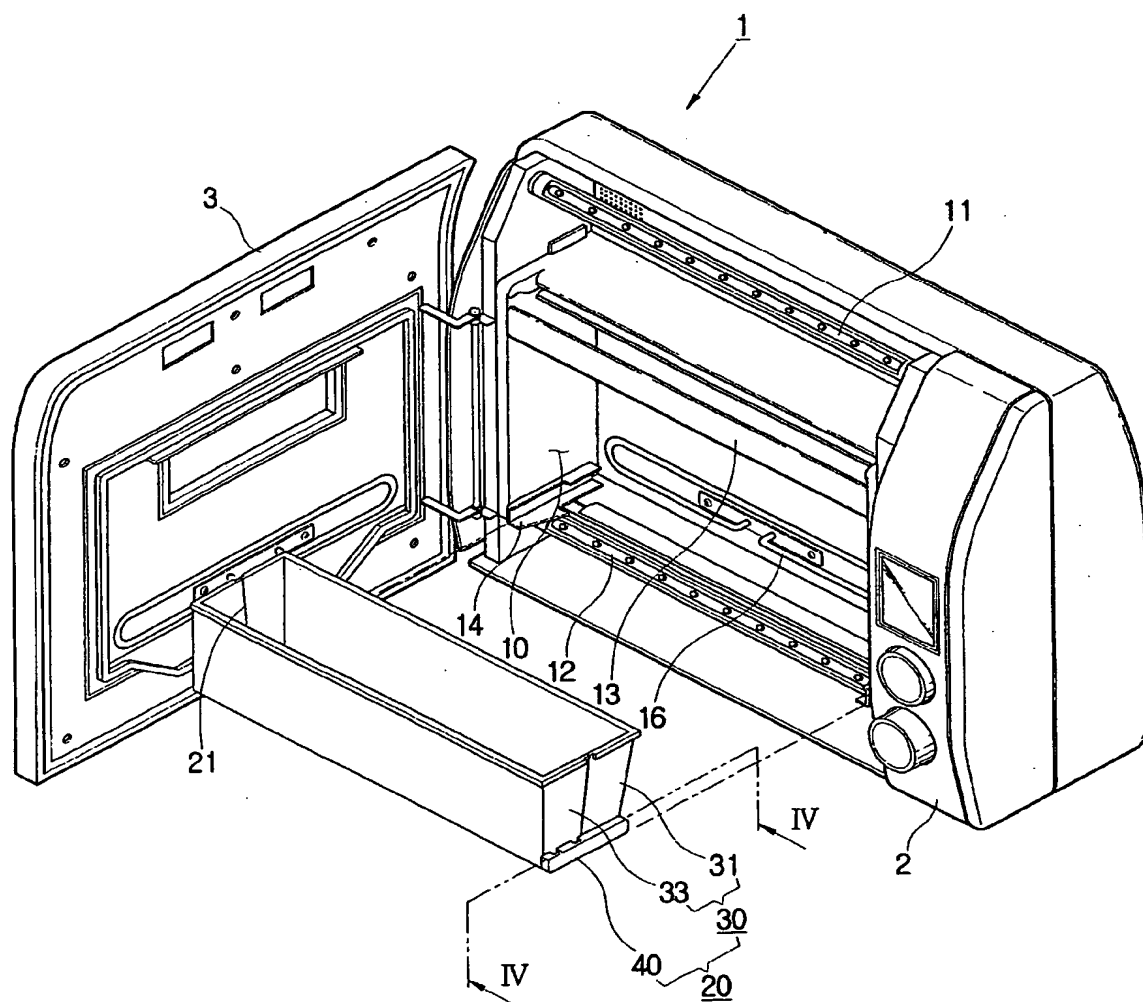




FIG. 2

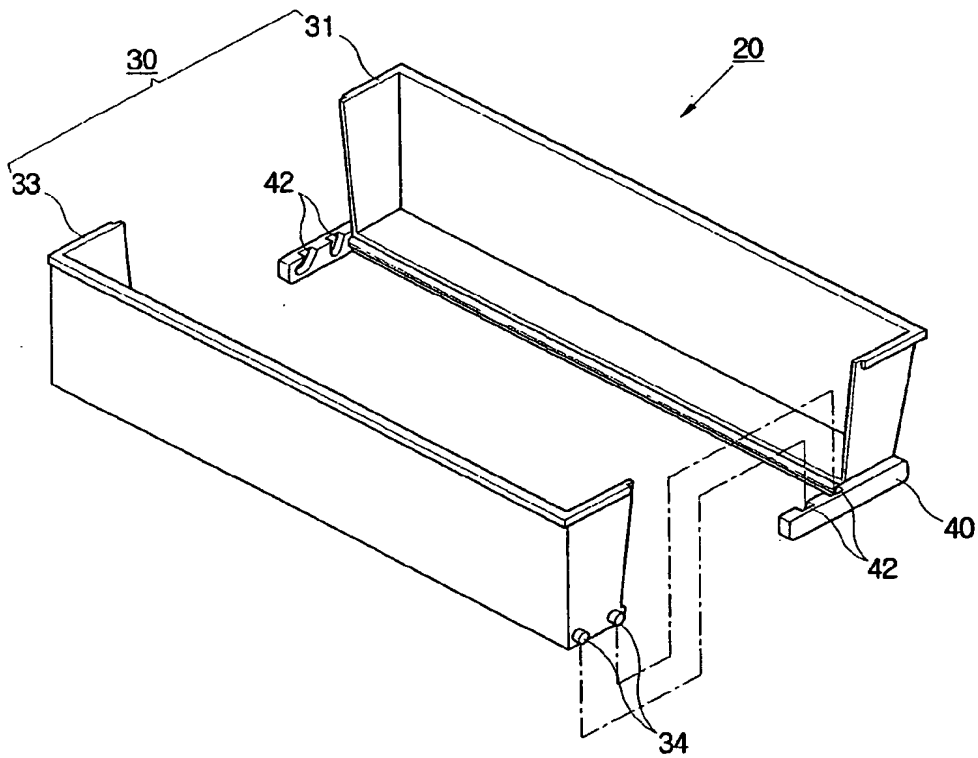


FIG. 3

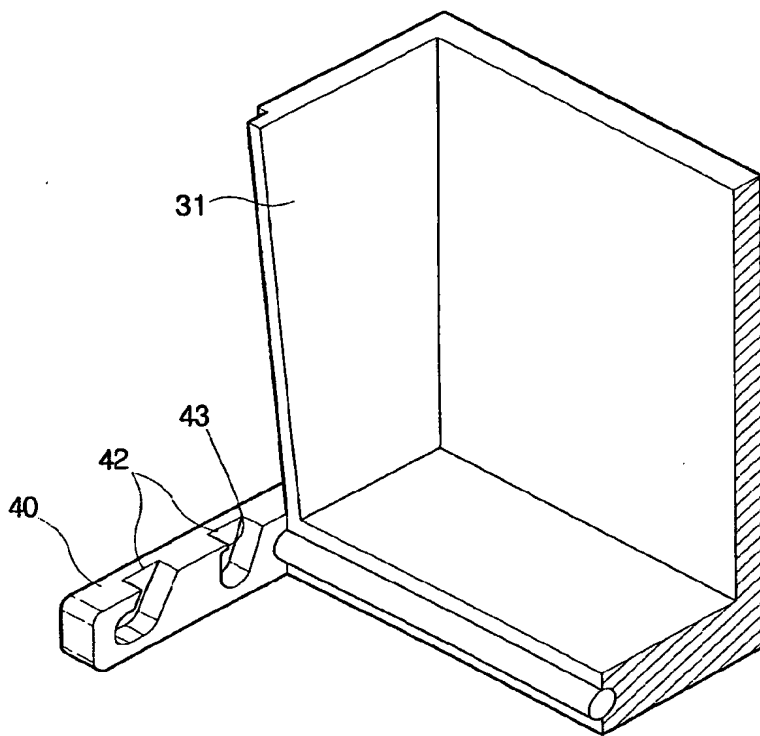


FIG. 4A

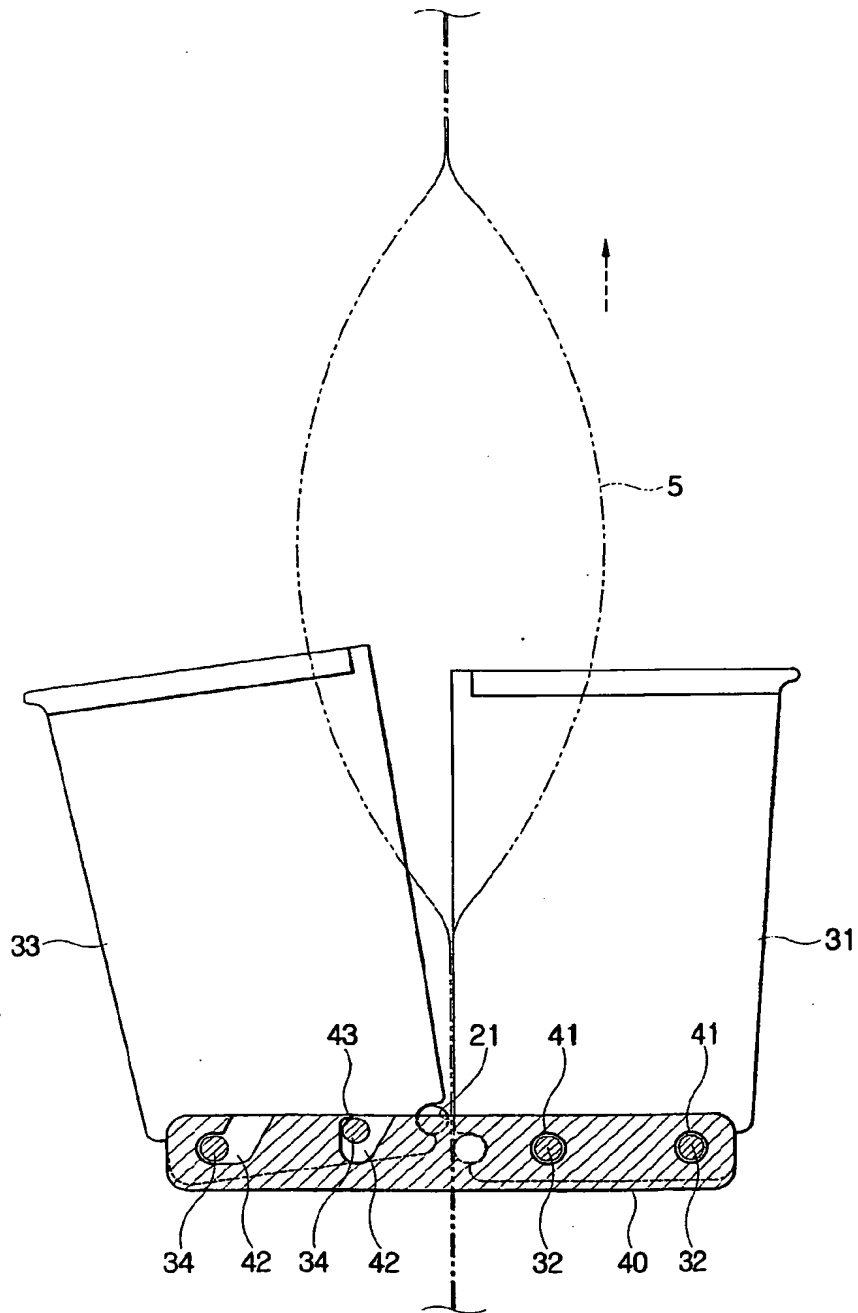


FIG. 4B

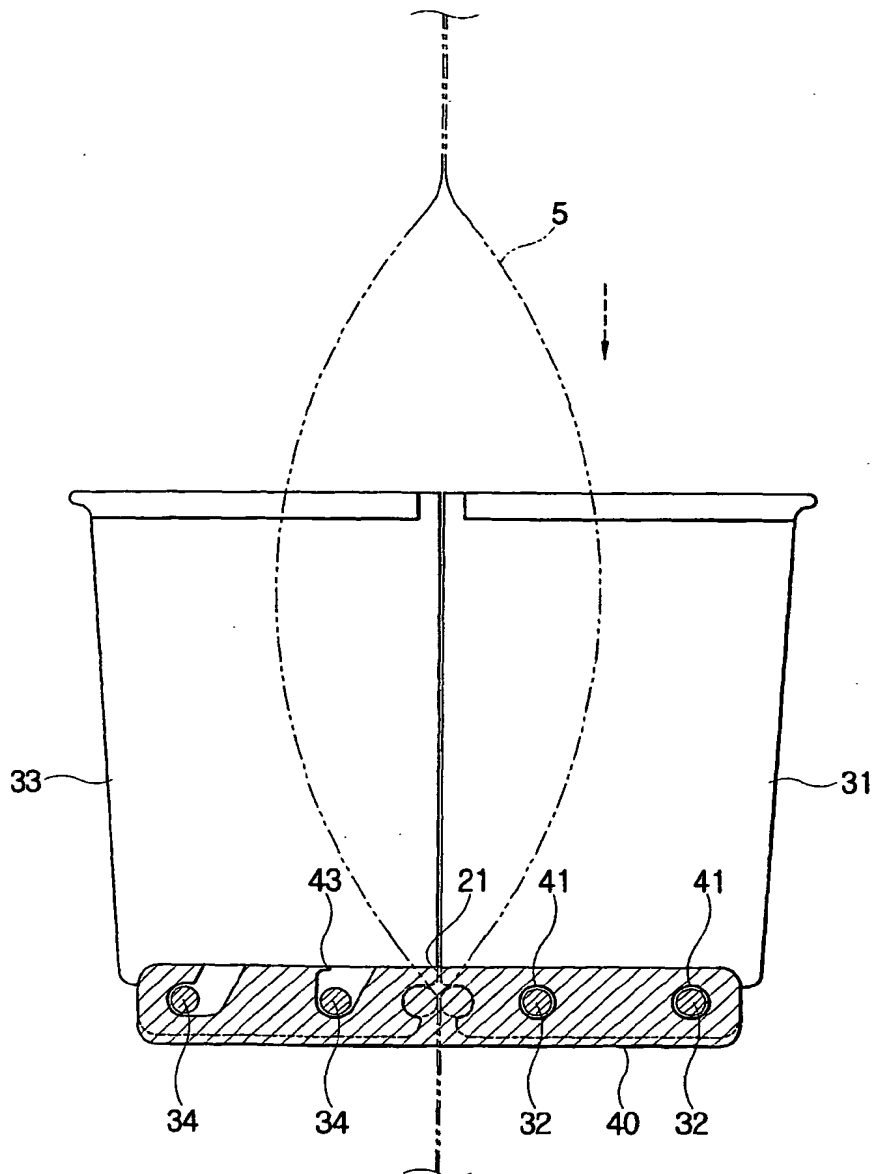


FIG. 5  
(PRIOR ART)

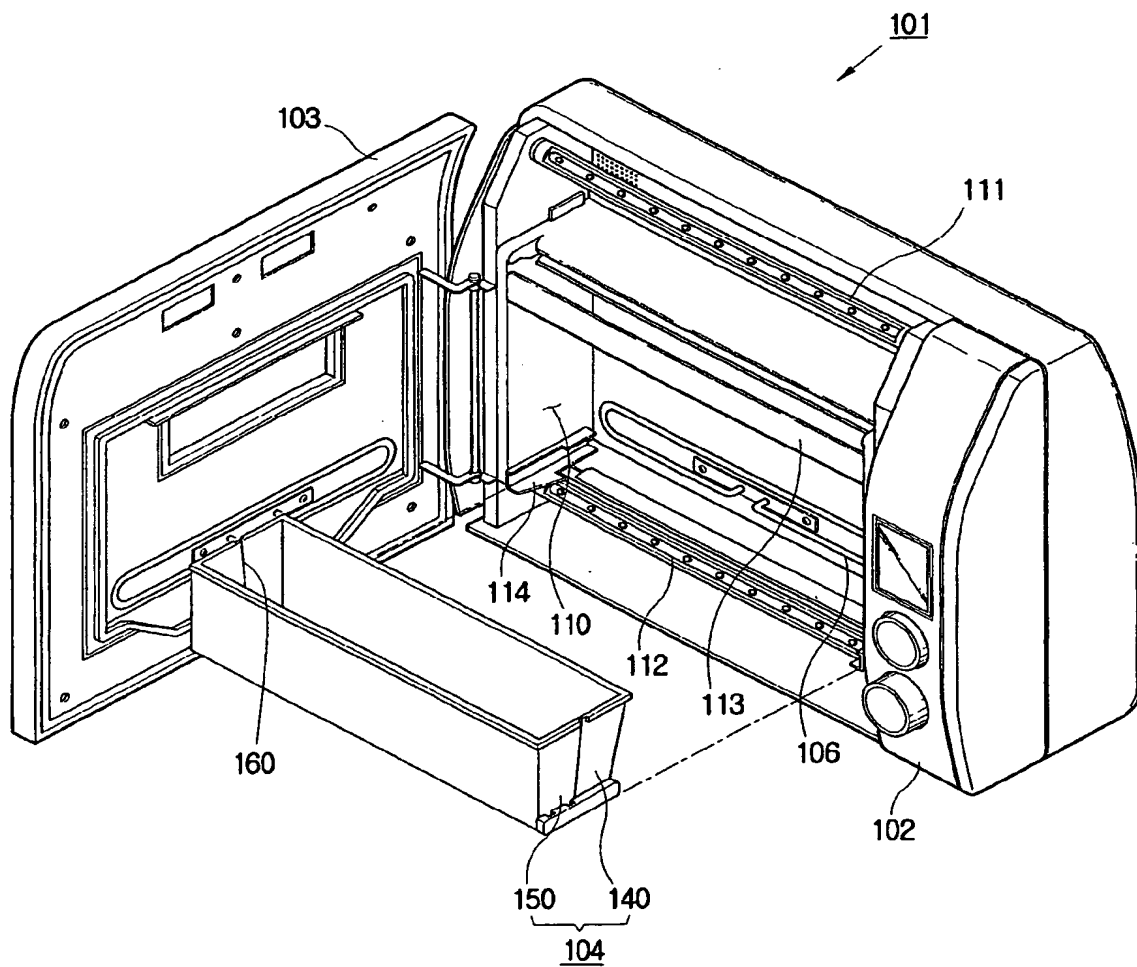
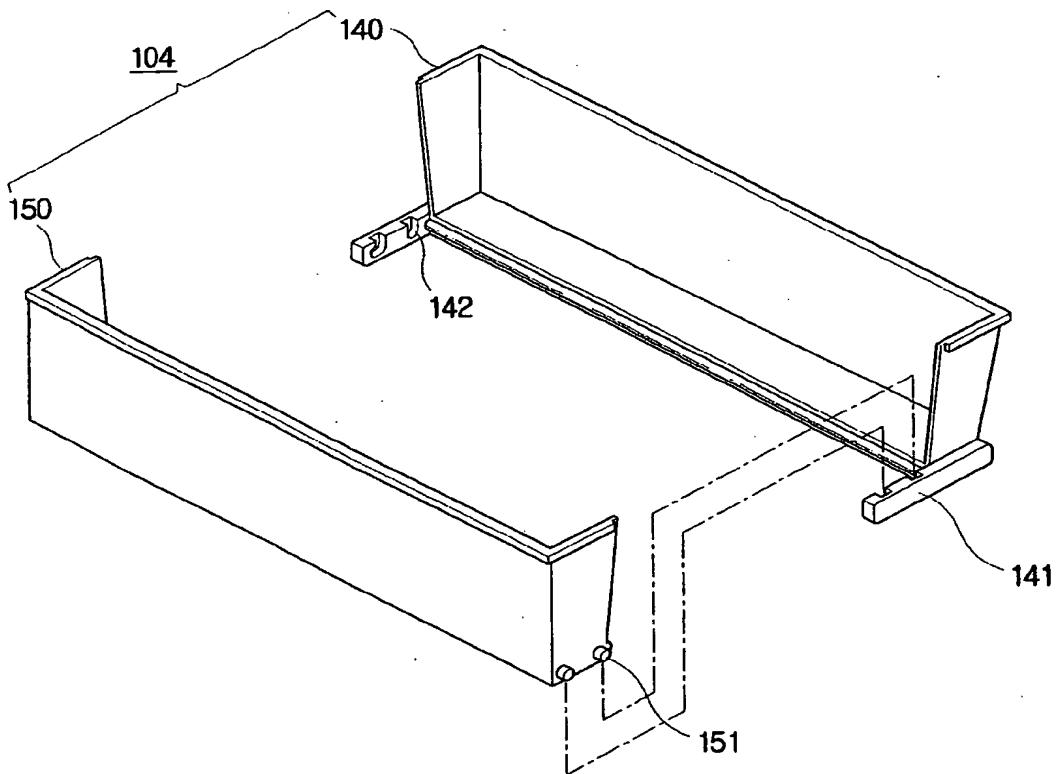


FIG. 6  
(PRIOR ART)





European Patent  
Office

## EUROPEAN SEARCH REPORT

Application Number  
EP 02 25 8730

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
A	WO 99 25467 A (HEDEN TEAM AG ; HEDENBERG ROLF P (SE); IDEA INC (US)) 27 May 1999 (1999-05-27) * the whole document *	1,3-6, 8-16, 18-21	A21B7/00
D,A	DATABASE WPI Section Ch, Week 200305 Derwent Publications Ltd., London, GB; Class D11, AN 2003-055566 XP002259438 & KR 2002 056 628 A (SAMSUNG ELECTRONICS CO LTD), 10 July 2002 (2002-07-10) * abstract *	1,16,21	
A	WO 92 10100 A (HEDEN TEAM AG) 25 June 1992 (1992-06-25)		
A	US 4 803 086 A (HEDENBERG GUNNAR) 7 February 1989 (1989-02-07)		
A	US 4 590 850 A (HEDENBERG GUNNAR) 27 May 1986 (1986-05-27)		TECHNICAL FIELDS SEARCHED (Int.Cl.7)
A	WO 86 03931 A (HEDENTEAM AG ; HEDENBERG GUNNAR (SE)) 17 July 1986 (1986-07-17)		A21B
The present search report has been drawn up for all claims			
Place of search <b>THE HAGUE</b>		Date of completion of the search <b>28 October 2003</b>	Examiner <b>Silvis, H</b>
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	

EPO FORM 1503 03/02 (PDC/CI)

**ANNEX TO THE EUROPEAN SEARCH REPORT  
ON EUROPEAN PATENT APPLICATION NO.**

EP 02 25 8730

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on  
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

28-10-2003

Patent document cited in search report		Publication date	Patent family member(s)		Publication date
WO 9925467	A	27-05-1999	AT	235312 T	15-04-2003
			AU	737768 B2	30-08-2001
			AU	1414599 A	07-06-1999
			BR	9814876 A	03-10-2000
			CA	2310844 A1	27-05-1999
			DE	69812691 D1	30-04-2003
			EA	1996 B1	22-10-2001
			EP	1032468 A1	06-09-2000
			HU	0100951 A2	28-12-2001
			JP	2001523444 T	27-11-2001
			NO	20002561 A	18-05-2000
			NZ	504301 A	30-11-2001
			PL	340637 A1	12-02-2001
			TW	391867 B	01-06-2000
			WO	9925467 A1	27-05-1999
			US	5947009 A	07-09-1999
			ZA	9810497 A	14-07-1999
<hr/>					
KR 2002056628	A	10-07-2002	NONE		
<hr/>					
WO 9210100	A	25-06-1992	WO	9210100 A1	25-06-1992
			US	5146840 A	15-09-1992
<hr/>					
US 4803086	A	07-02-1989	WO	8603931 A1	17-07-1986
			AT	393771 B	10-12-1991
			AT	903086 A	15-06-1991
			AT	47002 T	15-10-1989
			BE	906013 A1	16-04-1987
			BR	8507305 A	03-11-1987
			BR	8607054 A	23-02-1988
			CA	1268665 A1	08-05-1990
			CH	671321 A5	31-08-1989
			DE	3573512 D1	16-11-1989
			DE	3690660 C2	27-05-1993
			DE	3690660 T	10-03-1988
			DK	393186 A	19-08-1986
			DK	409587 A	06-08-1987
			WO	8703784 A1	02-07-1987
			ES	2003997 A6	01-12-1988
			FI	872791 A ,B,	23-06-1987
			FI	873605 A ,B,	20-08-1987
			FR	2591865 A1	26-06-1987
			GB	2191928 A ,B	31-12-1987
			JP	6055102 B	27-07-1994
			JP	1500320 T	09-02-1989
			KR	9110203 B1	21-12-1991

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82



**ANNEX TO THE EUROPEAN SEARCH REPORT  
ON EUROPEAN PATENT APPLICATION NO.**

EP 02 25 8730

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on  
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

28-10-2003

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 4803086 A		NL 8620514 T	23-12-1985
		NO 863316 A ,B,	18-08-1986
		NO 873503 A ,B,	19-08-1987
		SE 465994 B	02-12-1991
		SE 8703161 A	14-08-1987
US 4590850 A	27-05-1986	US 4550654 A	05-11-1985
WO 8603931 A	17-07-1986	WO 8603931 A1	17-07-1986
		AT 393771 B	10-12-1991
		AT 903086 A	15-06-1991
		AT 47002 T	15-10-1989
		BE 906013 A1	16-04-1987
		BR 8507305 A	03-11-1987
		BR 8607054 A	23-02-1988
		CA 1268665 A1	08-05-1990
		CH 671321 A5	31-08-1989
		DE 3573512 D1	16-11-1989
		DE 3690660 C2	27-05-1993
		DE 3690660 T	10-03-1988
		DK 393186 A	19-08-1986
		DK 409587 A	06-08-1987
		WO 8703784 A1	02-07-1987
		ES 2003997 A6	01-12-1988
		FI 872791 A ,B,	23-06-1987
		FI 873605 A ,B,	20-08-1987
		FR 2591865 A1	26-06-1987
		GB 2191928 A ,B	31-12-1987
		JP 6055102 B	27-07-1994
		JP 1500320 T	09-02-1989
		KR 9110203 B1	21-12-1991
		NL 8620514 T	23-12-1985
		NO 863316 A ,B,	18-08-1986
		NO 873503 A ,B,	19-08-1987
		SE 465994 B	02-12-1991
		SE 8703161 A	14-08-1987
		US 4803086 A	07-02-1989
		AU 592318 B2	11-01-1990
		AU 5301386 A	29-07-1986
		CA 1262658 A1	07-11-1989
		EP 0243364 A1	04-11-1987

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82